IN THE SPECIFICATION:

Please amend the correspondingly enumerated paragraphs as follows:

[0008] These works led ~~researches~~ <u>researchers</u> on a quest to discover low-k materials and structures for use in APD multiplication regions. For example, Campbell et al., have demonstrated that noise and gain-bandwidth performance can be significantly improved by utilizing very thin multiplication regions. They noted that InP has approximately equal hole and electron ionization rates (i.e., $k \cong 1$) and that, therefore, InP APD's have high multiplication noise. They proposed an APD having a thin (200nm-400nm) $In_{0.52}Al_{0.48}As$ multiplication region; demonstrated to result in $k = 0.18$. They also noted, however, that thinning the multiplication region must be accompanied by an increase in the carrier concentration in the multiplication region. Otherwise, electric field in the narrow-bandgap absorbing layer would be too high and tunneling will ensue, leading to excessive dark current.

[0040] In Figure 4a, block 400 represents an APD having an absorption layer AL (e.g., InGaAs), an intermediate-bandgap transition layer TL (e.g., InGaAsP), and a multiplication layer ML (e.g., InP). The relative thickness of the various layers is provided arbitrarily only as a demonstration. The layers are aligned with the Y-axis of the graph, which represents location along the bulk of the APD. The X-axis ~~represent~~ <u>represents</u> electrical field caused by voltage applied across the APD. The value of electric field that generates unacceptable tunneling current, i.e., tunneling onset field, is represented by line 410. The value of electric field that is at the breakdown point of the multiplication region is represented by line 420. Starting with a normal operation of the APD, that is, the voltage applied across the APD is lower than the multiplication region breakdown voltage, the field generated is exemplified by curve 430. As can be seen, since the applied voltage is below the breakdown voltage, the field in the multiplication region is below the breakdown value. Similarly, the field in the absorption region is below the unacceptable tunneling current value. This is the "optimal" situation sought after by prior art researchers, i.e., a fast response APD having low noise. For a similar depiction, see Figure 3.4 in Torbjoern Nesheim's

Master Thesis: Single Photon Detection Using Avalanche Photodiode, 1999 (available
for download at www.vad1.com/qcr/torbjoern).

[0053] The various elements of the system of Figure 6 will be described with
reference to its operational modes. Generally, the system operates in two modes:
navigation mode and detection mode. In the description, references to "navigation
mode" should be understood to include navigation, target acquisition, and imaging.
Therefore, these terms may be used interchangeably herein. In the navigation mode,
an illumination source 630 is used to illuminate the DUT. Illumination source 630
emits light in the infrared range using, for example, an IR laser, tungsten, or a halogen
lamp. The light is focused onto and then reflects from the DUT to be collected by the
collection optics 620 and selectively directed towards the imager 645 via beam splitter
660. The imager 645 can be any two-dimensional detector capable of imaging in the
infrared range, such as, for example, a vidicon. IR vidicons are commercially
available from, for example, Hamamatsu (http://usa.hamamatsu.com). Beam splitter
mirror 665 is used to deflect part of the collected light to the optional focusing system
640. Alternatively, the imager 645 may be used for focusing.

[0055] Additionally, a mechanized aperture 670 is provided at the image plane of the
collection optics 620, together with field lens 695. Notably, in this embodiment the
image plane of collection optics 620 is generated in two locations: at aperture 670 and
lens 695, and at the detector 645. A feature of this embodiment is that the mechanized
aperture 670 is illuminated from behind and is used to define the field of view at the
image plane. That is, depending on the particular test to be run, one may wish to
select any particular section of the DUT for emission. Using information about the
chip design and layout stored in a CAD software, such as, for example, Cadence, and
using navigation software, such as, for example, Merlin's Framework available from
Knights Technology (www.electroglass.com), one may select a particular device for
emission test. When the user selects a device or location, the system activates the

stage 675 so that the collection optics is centered on the selected device or location.

Then, the aperture 670 may be adjusted to increase or decrease the field of view as

appropriate for the particular test desired.